

Appl. No. 10/815,164
Response Dated May 1, 2006
Reply to Office Action of January 31, 2006

• • • R E M A R K S / A R G U M E N T S • • •

The Office Action of January 31, 2006 has been thoroughly studied. Accordingly, the changes presented herein for the application, considered together with the following comments, are believed to be sufficient to place the application into condition for allowance.

By the present amendment, Claim 17 has been changed to correct what was previously a hyphenated word, which was improperly hyphenated.

It is believed that the change presented herein for Claim 17 is properly enterable after Final because it is a minor change the does not raise any new issues or considerations.

Claims 1-17 are pending in this application.

Claims 1-17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,290,909 to Chen et al. in view of International Patent Publication No. WO 01/29136 to Nippon Mektron, Limited.

For the reasons set forth below, it is submitted that all of the pending claims are allowable over the prior art of record and therefore, the outstanding prior art rejection of the claims should properly be withdrawn.

Favorable reconsideration by the Examiner is earnestly solicited.

The Examiner has relied upon Chen et al. as disclosing:

...polyimide film compositions applied to metallic foil substrates comprising the reaction product of applicant's claimed components (B), (C), (D₁), and (D₂) (abstract; example 1). Examples show the applicant's claimed ratios of (C) to

Appl. No. 10/815,164
Response Dated May 1, 2006
Reply to Office Action of January 31, 2006

(D₁) or (D₂) (examples 1-2). The examples also teach the claimed method of applying a polyamic acid in a polar solvent, drying the film, and heating the film to form the polyimide. Flexible circuit boards are noted (col. 5 lines 17-25).

The Examiner concedes that Chen et al. fails to teach a mixture of dianhydride monomers.

The Examiner next relies upon Nippon Mektron as teaching:

...copolyimides, where mixtures of dianhydrides are used. Component (A) is used with a second dianhydride similar to (B) and reacted with (C) to enhance solubility of the resulting polyimide (col. 2 lines 14-21; examples).

In combining the teachings of Chen et al. and Nippon Mektron, the Examiner takes the position that:

...it would have been prima facie obvious to combine components (B) and (A) in the applicant's claimed ratios to provide a finished polyimide film with enhanced solubility.

The disclosure of Nippon Mektron which discusses solubility (taken from column 2, lines 14-21 of U.S. Patent No. 6,489,436 to Lin et al.) is as follows:

When component (A) and component (B) are used together, component (B) is used in a proportion of not more than about 90 mol. %, preferably not more than about 80 mol. % to the mixture thereof with component (A). When component (B) is used in a higher proportion, the proportion of component (A) will be correspondingly not more than about 10 mol. %, and the solubility of the resulting polyimide copolymer in an organic solvent will be lowered

As the Examiner will note, the issue of the solubility involves the combined use of component (A) and (B), and not (B) alone.

Appl. No. 10/815,164
Response Dated May 1, 2006
Reply to Office Action of January 31, 2006

Therefore, absent the use of component (A) - which Chen et al. does not teach, per the Examiner - there is no teaching or concern about the "solubility" of a "resulting polyimide copolymer" according to Nippon Mektron.

Stated another way, the issue or concern of "solubility" of the "resulting polyimide copolymer" of Nippon Mektron will not arise in Chen et al. until the Examiner makes the combination of Chen et al. and Nippon Mektron.

Accordingly, it cannot be said that it would be "obvious" to make the combination of Chen et al. and Nippon Mektron, and thereby create an issue or concern of solubility and then solve that issue according to the teachings of Nippon Mektron.

The Examiner's stated motivation to make the combination of Chen et al. and Nippon Mektron is to "enhance solubility."

However, since there is no stated or disclosed problem of solubility in Chen et al. and because the issue of solubility only comes into play when components (A) and (B) as used, there is no motivation to combine Chen et al. and Nippon Mektron to enhance solubility.

Further, it is noted that applicants' combined use of components (A) and (B) is not limited to issue involving solubility.

Note as stated on page 14, lines 15-18 of applicants' specification:

In Comparative Example 1, the film after etching was so brittle that determination of "percent shrinkage after etching" and "percent heat shrinkage" could not be determined.

Appl. No. 10/815,164
Response Dated May 1, 2006
Reply to Office Action of January 31, 2006

In this Comparative Example 1, component (A) was not used.

By comparing applicants' Example 1 (in which Components (A) and (B) were used) to Comparative Example 1 (in which only component (B) is used) one can appreciate clear differences in the test data which are not obvious over the teachings of the prior art.

On page 3 of the Office Action under the *Response to Arguments* section the Examiner states that:

...the comparative example does not specifically teach that the absence of (A) provides any improvements since the comparative example is not a direct comparison with the working example.

Further the Examiner states:

In comparative example 5, three diamines have been used, where only two diamine have been used in example 5. Thus the results are not necessarily dependent on the dianhydride component.

Example 1 uses:

520.1 g (1.0 mole) of (A) isopropylidenebis(4-phenyleneoxy-4-phthalic acid) dianhydride;
294.0 g (1.0 mole) of (B) 3,3',4,4'-biphenyltetracarboxylic acid dianhydride; and
448.0 g (2.0 moles) of (C) 6-amino-2-(p-aminophenyl)-benzimidazole.

Comparative Example 1 uses:

588.0 g (1.0 mole) of (B) 3,3',4,4'-biphenyltetracarboxylic acid dianhydride; and
448.0 g (2.0 moles) of (C) 6-amino-2-(p-aminophenyl)-benzimidazole.

Appl. No. 10/815,164
Response Dated May 1, 2006
Reply to Office Action of January 31, 2006

A comparison between Example 1 and Comparative Example 1 shows the effect of using components (A) and (B) instead of only (B), which compares to the teachings of Nippon Mektron and Chen et al.

In any event, there remains no motivation within the teachings of the prior art to modify Chen et al. to include a component (A) to "enhance solubility" based upon the teachings of Nippon Mektron since the issue of solubility is not based upon Chen et al.'s sole use of component (B), but only on the combined use of components (A) and (B).

Based upon the above distinctions between the prior art relied upon by the Examiner and the present invention, and the overall teachings of prior art, properly considered as a whole, it is respectfully submitted that the Examiner cannot rely upon the prior art as required under 35 U.S.C. §103 to establish a *prima facie* case of obviousness of applicants' claimed invention.

It is, therefore, submitted that any reliance upon prior art would be improper inasmuch as the prior art does not remotely anticipate, teach, suggest or render obvious the present invention.

It is submitted that the claims, as now amended, and the discussion contained herein clearly show that the claimed invention is novel and neither anticipated nor obvious over the teachings of the prior art and the outstanding rejection of the claims should hence be withdrawn.

Therefore, reconsideration and withdrawal of the outstanding rejection of the claims and an early allowance of the claims is believed to be in order.

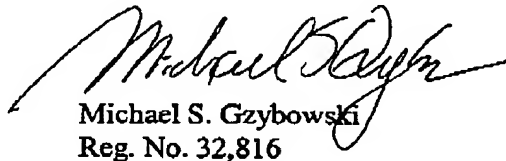
It is believed that the above represents a complete response to the Official Action and reconsideration is requested.

Appl. No. 10/815,164
Response Dated May 1, 2006
Reply to Office Action of January 31, 2006

If upon consideration of the above, the Examiner should feel that there remain outstanding issues in the present application that could be resolved; the Examiner is invited to contact applicants' patent counsel at the telephone number given below to discuss such issues.

To the extent necessary, a petition for an extension of time under 37 CFR §1.136 is hereby made. Please charge the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 12-2136 and please credit any excess fees to such deposit account.

Respectfully submitted,



Michael S. Gzybowski
Reg. No. 32,816

BUTZEL LONG
350 South Main Street
Suite 300
Ann Arbor, Michigan 48104
(734) 995-3110

148820.1